Feb. 21, 1939. W. M. LEESON 2,148,376

CYLINDER PAPER-MAKING MACHINE

Filed Jan. 15, 1937

Fig. 1.

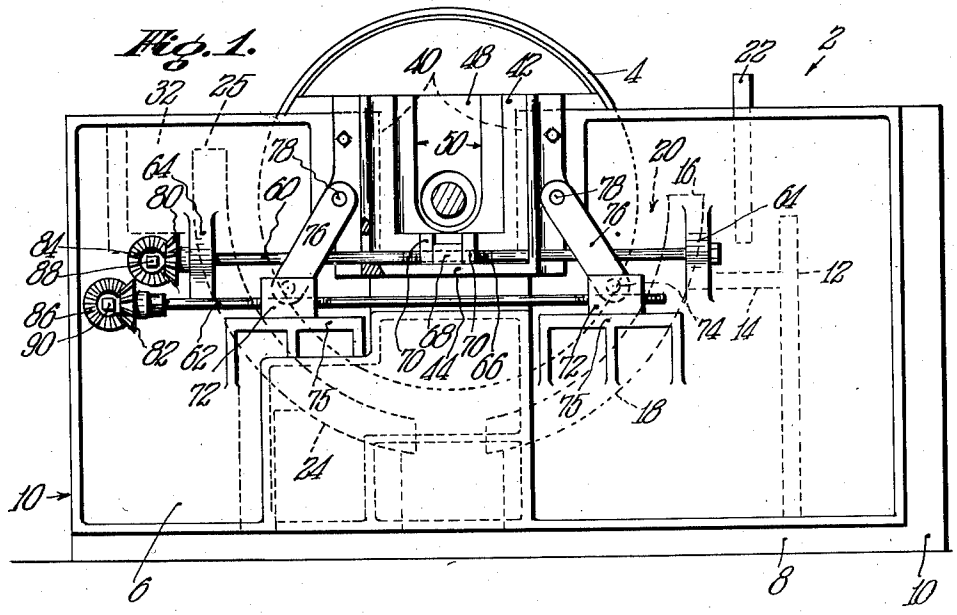
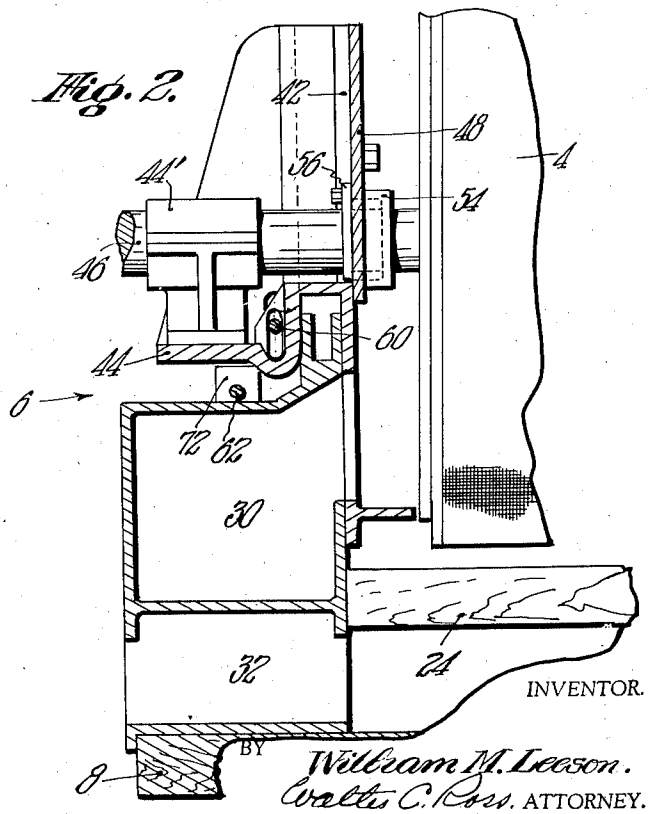


Fig. 2.



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CYLINDER PAPER-MAKING MACHINE

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1 Claim. (Cl. 92—43)

This invention relates to improvements in paper-making apparatus and is directed more particularly to improvements in cylinder paper-making machines.

The principal objects of the invention are directed to the provision of paper-making apparatus wherein a cylinder mould is adjustable relative to the adjacent wall or walls of the vat in order to meet various conditions and requirements.

In paper-making apparatus of the type to which the invention relates a cylinder mould rotates in a vat which is provided with a wall or walls adjacent the mould, there being a space between the mould and wall for paper-making material, the fibers of which are taken on by the foraminous surfaces of the mould.

In order to produce certain results insofar as possible the wall or walls have been of certain contours and spaced certain distances from the cylinder mould. That is to say, when it is desired to produce a certain kind of paper it has been customary to locate the wall or walls adjacent the cylinder mould and so form it in such a way as to provide a certain space between the mould and wall and to use paper-making material of certain consistency and rotate the mould in a certain way. In other words, for certain predetermined results the wall is of a certain shape and a certain distance from the cylinder mould, the characteristics of the paper-making material for the particular result are more or less definite, and the speed of the cylinder is within a certain range. The space between the cylinder and wall is of course constant and therefore an important factor and the characteristics of the paper-making material, speed of the cylinder, and other factors must consequently be controlled within relatively narrow limits.

Where it is desired or necessary to produce the same kind of paper continuously it is possible to produce reasonably good results but it is difficult and sometimes impossible to vary all of the factors to produce equally good results where it is desired to produce other kinds of paper because of the definite relationship of the cylinder and wall. To produce a certain result with paper-making material of certain characteristics the cylinder and wall must have a certain relationship. Where it is desired to product another result with the same or different paper-making material the cylinder and wall should have a different relationship. But since the relationship is constant it is impossible at times to use the material desired. Altogether the type of paper-making material and speed of the cylinder are varied in order to accommodate the constant relationship of the cylinder and wall.

According to this invention, instead of varying the numerous factors in order to produce a certain result or a certain kind of paper or of attempting to make the various factors accommodate themselves to the definite relationship of the cylinder mould and adjacent wall, there is provided a wall or walls adjacent the cylinder which are of such shape as suffice for general purposes and the cylinder is adjustable relative to the wall or walls. To accomplish this the cylinder mould is movable back and forth and up and down relative to the vat and the wall or walls adjacent thereto so as to provide a varying space between the cylinder mould and wall.

It is possible to set the cylinder mould to provide either a small or relatively greater space between it and the adjacent wall and the said space may be of greater width at its upper than at its lower side or it may have a constant width. Or the cylinder may be moved to provide spaces between it and adjacent walls which are similar or are relatively larger or smaller than one another.

It being possible to vary the space between the cylinder and wall or walls, the varying of results within wide limits is facilitated. That is to say, with a certain result to be obtained by the use of a certain paper-making material, a certain operating speed, etc. the mould may be located with reference to the adacent wall or walls to provide such a space as will operate to the best advantage with the other factors to give the desired result. For instance, to produce a certain kind of paper with a paper-making material having certain characteristics the space between the cylinder and wall may need to have a certain form while to produce another kind of paper with the same or another type of paper-making material the space may need to be different. The adjustability of the cylinder relative to the adjacent wall or walls therefrom makes it possible to produce the desired results by the use of paper-making material best suited for those results. The paper-making apparatus is variable to accommodate the desired results and conditions rather than conditions being varied to suit the apparatus, all to the end that not only is economy and efficiency in operation made possible but the results are within control and uniform papers are produced.

The invention may be practiced in various ways but for purposes of disclosure the following de-

scription refers to the accompanying drawing wherein:

Fig. 1 is an end elevational view of a paper-making apparatus embodying the novel features of the invention; and

Fig. 2 is an enlarged fragmentary sectional elevational view taken through one end of the apparatus shown in Fig. 1.

Referring now to the drawing in detail the invention will be fully described.

In Fig. 1 which is an end elevational view of the apparatus of the invention there is shown a vat 2 in which is rotatable a cylinder mould 4 of usual form. As in apparatus of this type, the cylinder may be rotated by any suitable means.

At the forward and rear ends of the vat 2 there is an end plate or end wall member such as 6 which may be of cast iron or some other suitable material. Between the end plates 6 there is a bottom wall 8 and side walls 10 and the said end plates and walls are suitably secured together in vat-forming relation.

A vertical wall is indicated by 12 to provide with the end, right-hand side and bottom walls 6, 8 and 10, what may be called an inlet chamber. Paper-making material may be delivered to this chamber in any desired manner so that it flows up and over wall 12, across a horizontal wall 14, and up and over the upper end 16 of a wall 18 into a space 20 between cylinder 4 and said wall 18. A baffle 22 may be provided which is adjustable up and down relative to walls 12 and 18 if desired.

The wall 18 is curved as shown to more or less follow the curvature of the cylinder mould and a continuation thereof, or another separate similar wall 24, is provided at the other side of the cylinder. As paper-making material is delivered into the space in which the cylinder rotates the fibers thereof are taken on by the cylinder mould and water passing through the foraminous surface of the cylinder passes into compartment 30 of the end plate or plates while excess paper-making material passes up and over the upper end 25 of wall 24 and into chamber 32. Excess water and paper-making material are conducted from the vat in the usual way.

By curving the walls 18 and 24 substantially as shown and by providing means for moving or adjusting the cylinder up and down and back and forth in the vat relative to said walls it is possible to provide a relationship of the cylinder and wall or a space therebetween of variable size and form. Means for moving or adjusting the cylinder may be associated with each end plate 6 and since the means at each end of the vat will be substantially similar a description of the means at one end of the vat will suffice.

The end plate 6 at its upper side is cut away to provide an open-ended or U-shaped opening 40 and a supporting plate 42 has its side and lower edges formed to receive the plate 6 at its edges around said opening. In this way the plate 42 is slidable up and down and back and forth relative to the end plate.

A shelf part or ledge 44 extends forwardly of the supporting plate 42 and this may support a bearing or journal 44' for shaft 46 of the cylinder mould. For clearness, the bearing 44' is omitted in Fig. 1. An inner plate 48 lies against the supporting plate 42 and overlies an open-ended slot 50 therein.

A stuffing box 54 provided on plate 48 receives the shaft 46 and there may be a gland 56 associated therewith for packing the shaft and allowing rotation thereof. As previously explained, the supporting plate 42 is adjustable on plate 6 up and down as well as back and forth and this may be accomplished in various ways.

According to one embodiment of the invention there are upper and lower screws or threaded shafts 60 and 62. The upper shaft 60 is rotatable in bearings 64 associated with plate 6 and a threaded portion 66 thereof is in threaded engagement with a nut 68 which is disposed between abutments 70 associated with the plate 42. As member 60 is rotated the plate 42 is moved back and forth in one direction or the other according to the direction of rotation of said member 60.

The screw shaft 62 has threaded portions 62 which are preferably right and left hand and these threadedly engage block members 72 that are guided on or in shelves 75 associated with and extending forwardly from plate 6. By rotating member 62 in one direction or the other the blocks 72 are moved towards or away from one another. The blocks 72 have pivoted thereto as at 74 the lower ends of links or connectors 76 the upper ends of which links are pivoted at 78 to plate 42 whereby the said plate 42 is moved up or down by the blocks 72 and screw shaft 62.

The screw shafts 60 and 62 may be rotated in any well known manner but in the form of the invention shown they carry gears 80 and 82 which mesh with gears 84 and 86 respectively. These latter gears may be fixed to the forward ends of longitudinally extending shafts 88 and 90 which carry on their other ends other gears similar to those gears 84 and 86 for operating screw shafts associated with the end plate at the other or rear end of the vat. In this way as shafts 88 and 90 are rotated the shafts 60 and 62 associated with both end plates are simultaneously rotated.

Thus it will be seen, one shaft and associated gears are adapted to move the plate up and down so as to move the cylinder up and down, while the other shaft and its associated gears are adapted to move the cylinder back and forth.

While I have described the invention in great detail and with respect to a preferred form thereof, it is not desired to be limited thereto since many changes and modifications may be made therein without departing from the spirit and scope of the invention. What it is desired to claim and secure by Letters Patent of the United States is:

Paper making apparatus comprising in combination, a vat having end walls and spaced relatively fixed rigid longitudinal walls therebetween extending downwardly and inwardly from their upper portions, a cylinder between said walls, supporting plates rotatably supporting the cylinder slidable on the end walls, means associated with the end walls and supporting plates for moving said plates vertically relative to the end walls and means for moving said plates horizontally relative to the end walls, all adapted and arranged whereby said cylinder may be moved towards and away from and up and down relative to the longitudinal walls to vary the space between said cylinder and walls at the sides and bottom of the cylinder, the first named means including blocks slidably guided on the end walls for movements towards and away from one another, links connected at opposite ends to said blocks and to said supporting plates and rotatable actuating members held against axial movements having screw threads formed thereon and engaged in corresponding screw threads formed in said blocks.

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